

REMARKS

By the present amendment, independent claims 1 and 33 and dependent claims 21, 28 and 36 have been amended to obviate the examiner's objections thereto and/or to further clarify the concepts of the present invention. In addition, claims 22, 38 and 45 through 56 have been cancelled without prejudice or disclaimer. Claims 1, 21, 23-28, 31-37 and 39-44 are now pending. Entry of these amendments is respectfully requested.

In the Office Action, claims 1, 23-28, 31-34, 39-45 and 48-56 were rejected under 35 USC § 102(b) as being unpatentable over the patent to Lee et al. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

Initially, it is to be noted that the cited section (b) of 35 USC § 102 requires that patent must have been patented more than one year prior to the filing date of the application for patent in the United States to be effective prior art to the application. The Lee et al patent was issued on February 27, 2001, whereas the subject application was filed in the United States on April 4, 2001, less than one year from the issue date of the patent. Thus, section (b) of 35 USC § 102 is not applicable relative to the Lee et al patent.

Furthermore, it is submitted that independent claim 1 as amended patentably distinguishes over the cited Lee et al patent. Among other things, the Lee et al patent does not teach the following features of subject low resistance value resistor as now defined by claim 1:

a) Self-supporting resistor body - Independent claim 1 has been amended herein to recite that the resistor body comprised by a resistive alloy has a thickness of 50-2000 μ m. As such, the resistor body is self-supporting. In distinct contrast, the cited Lee et al patent teaches the use of a film or foil as the resistor body and, as such, the resistor body would not be self-supporting. In this regard, attention is directed lines 47-56 of column 3 of the Lee et al patent.

b) Electrodes having a length equal to the width of the body - The Lee et al patent discloses a resistor in Figures 1 and 3-11 which includes resistive films 14 and 16 where each film is provided with a pair of terminations 18A, 18B and 20A and 20B respectively. These terminations perform the same general function as the electrodes in the presently claimed resistors.

As is best shown in Figure 1 of the Lee et al patent, terminations 18A, 18B and 20A have length which is greater than the width of resistive films 14 and 18. In distinct contrast, claim 1 as amended herein distinguishes over the disclosed electrodes in that the claim

requires "at least two electrodes, comprised by metal strips of flat tetragonal shape having a high electrical conductivity, each of said metal strips having a length equal with a width of said resistor body." It is submitted that this distinction is significant for the reasons set forth in the following.

c) Straight and uniform current path - As set forth above, the Lee et al patent discloses terminations 18A, 18B and 20A have length which is greater than the width of films 14 and 18. Therefore, "the straight and uniform current path structure" of the present invention cannot be obtained since the composite structure formed by the film and the termination would necessarily have an "L" or "T" overall shape which would not provide for a straight and uniform current path structure for the resistor. As set forth on page six of the subject specification, a uniform distribution of current in the electrode produces a low resistance value resistor of superior electrical characteristics.

Additionally, it is submitted that independent claim 33 as amended patentably distinguishes over the cited Lee et al patent. Among other things, the Lee et al patent does not teach the following features of subject low resistance value resistor as now defined by claim 33:

a) Self-supporting resistor body - As indicated above, the Lee et al patent teaches a resistive film instead of a self-supporting body.

b) Electrodes having a length equal to the width of the body - As detailed in the foregoing, the termination structures serving as electrodes in the resistor according to the Lee et al patent have a length which is greater than the width of the film serving as the resistor body.

c) Straight and uniform current path - For the reasons set forth relative to claim 1, the resistor according to the Lee et al patent would not have a straight and uniform current path due to the terminations extending beyond the width the resistive film.

d) Bonding electrodes - Claim 33 as amended requires that the resistor include two bonding electrodes of flat tetragonal shape disposed at both ends of a surface of the resistor body opposite to the surface having the electrodes. As is evident from a consideration of the Figures of the Lee et al patent, particularly Fig. 11 thereof, the disclosed resistor does not include bonding electrodes or similar structure thereto on surfaces of the films 14 and 16 opposed to the electrodes.

For the reasons stated above, it is submitted that the subject claims patentably distinguish over the cited Lee et al patent. Accordingly, withdrawal of the rejection under 35 U.S.C. § 102(b) and allowance of claims 1, 23-28, 31-34 and 39-44 over the cited Lee et al patent are respectfully requested.

Claims 33, 45 and 54-56 were rejected under 35 USC § 102(b) as being unpatentable over the patent to Smejkal et al. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

Again, it is to be noted that the cited section (b) of 35 USC § 102 requires that patent must have been patented more than one year prior to the filing date of the application for patent in the United States to be effective prior art to the application. The Smejkal et al patent was issued on August 27, 2002, whereas the subject application was filed in the United States on April 4, 2001, prior to the issue date of the patent. Thus, section (b) of 35 USC § 102 is not applicable relative to the Smejkal et al patent.

Further, it is submitted that independent claim 33 as amended patentably distinguishes over the cited Smejkal et al patent. Among other things, the Smejkal et al patent does not teach the following features of subject low resistance value resistor as now defined by claim 33:

a) Bonding electrodes of flat tetragonal shape - As mentioned above, claim 33 as amended requires that the resistor include two bonding electrodes of flat tetragonal shape disposed at both ends of a surface of the resistor body opposite to the surface having the electrodes. As is evident from a consideration of the Figures of the Smejkal et al patent, particularly Fig. 7A thereof, the disclosed resistor does not include bonding electrodes of

the shape recited on surfaces of resistor 28 opposed to the electrodes 30 and 32. In addition, clearly the portion of the solder layer 66 disposed at both ends of a surface of the resistor body 28 opposite to the surface having the electrodes is not of flat tetragonal shape.

b) Fused solder layer only on electrode - Claim 33 as amended herein recites that the claimed resistor includes a fused solder layer only on each surface of the electrodes. Again from a consideration of Figure 7A of the Smejkal et al patent, the disclosed solder layer 66, while being on the surface of electrodes 30 and 32, continues around the end of resistor body 28 and extends to the surface of the resistor body opposite to the surface having the electrodes. Consequently, this solder layer is not only on each surface of the electrodes as defined by claim 33.

For the reasons stated above, it is submitted that the subject claim patentably distinguishes over the cited Smejkal et al patent. Accordingly, withdrawal of the rejection under 35 U.S.C. § 102(b) and allowance of claim 33 over the cited patent are respectfully requested.

Claims 1, 22, 25, 28, 33-35, 38, 41, 44-45, 47, 50 and 53-56 were rejected under 35 USC § 102(b) as being unpatentable over the patent to Person et al. Reconsideration of this rejection in view of the above claim amendments and the following comments is

respectfully requested.

It is submitted that independent claim 1 as amended patentably distinguishes over the cited Person et al patent. Among other things, the Person et al patent does not teach the following features of subject low resistance value resistor as now defined by claim 1:

a) Insulation on entire upper surface of the resistor body - In Figure 11 relied upon in the Action for showing insulative material 52 on the upper surface of resistor body 40 according to the Person et al patent, it is to be specifically noted that this insulative material does not extend over the entire upper surface of the body. Rather, insulative material 52 only extends to the inner edges of conductive leads 48 and 50 which are also partially on the upper surface of the body 40. As a consequence, the Person et al patent does not disclose, as is recited in claim 1, that the resistor includes an insulation layer covering a portion of the surface of the resistor body defined between the electrodes. As explained at line 21 et seq. of page 18 of the specification, this layer being on the entire upper surface of the resistor body is important for safety and stability.

b) Fused solder layer on electrode - As acknowledged immediately above, the Person et al patent shows in Figure 11 thereof a resistor having conductive leads 48 and 50 partially on the upper surface of the body 40. Not only are these leads not conductive solder layers as required by claim 1, but these leads are not on electrodes. Rather, as is

set forth in lines 39-41 of col. 5 of the Person et al patent, these conductive leads are plated conductive material coated onto resistance element 42. Alternatively, if the conductive leads 48 and 50 were to be considered to be electrodes, the Person et al patent does not teach a fused solder layer.

c) Electrodes of metal strips of flat tetragonal shape - As indicated above, even if conductive leads 48 and 50 disclosed in the Person et al patent were to be considered to be electrodes, these leads would not be electrodes comprised by metal strips of flat tetragonal shape as defined by claim 1. Rather, the conductive leads 48 and 50 are on one surface of resistor body 42, extend around the end of resistor body and continue to the surface of the resistor body opposite to the first surface. Consequently, these conductive leads are not electrodes of metal strips of flat tetragonal shape as defined in the subject claim.

d) Diffusion layer - Claim 1 as amended recites that a diffusion layer is formed at an interface between the resistor body and the metal strip forming the electrode or in an interior of the resistor body under the metal strip forming the electrode. In view of the above discussion relative to the teaching deficiency of the Person et al patent with respect to a resistor having electrodes as presently claimed, it is submitted that by definition the patent cannot teach a diffusion layer at an interface or under such an electrode.

Additionally, it is submitted that independent claim 33 as amended patentably distinguishes over the cited Person et al patent. Among other things, the Person et al patent does not teach the following features of subject low resistance value resistor as now defined by claim 33:

a) Bonding electrodes of flat tetragonal shape - As mentioned above, claim 33 as amended requires that the resistor include two bonding electrodes of flat tetragonal shape disposed at both ends of a surface of the resistor body opposite to the surface having the electrodes. From a consideration of the Figure 11 of the Person et al patent, the disclosed resistor does not include separate and distinct bonding electrodes of the shape recited on surfaces of resistor element 42 opposed from electrodes also on the resistor element.

b) Fused solder layer on electrode - This distinction of the presently claimed invention over the Person et al patent was discussed in detail with reference to claim 1.

c) Diffusion layer - This distinction of the presently claimed invention over the Person et al patent was discussed in detail with reference to claim 1.

d) Electrodes of metal strips of flat tetragonal shape - This distinction of the presently claimed invention over the Person et al patent was discussed in detail with reference to claim 1.

For the reasons stated above, withdrawal of the rejection under 35 U.S.C. § 102(b) and allowance of claims 1, 22, 25, 28, 33-35, 38, 41 and 44 over the cited Person et al patent are respectfully requested.

Claims 26, 31-32, 42 and 51 were rejected under 35 USC § 103(a) as being unpatentable over the patent to Person et al in view of the patent to Smejkal et al. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

The above remarks relative to the teaching deficiencies of the Person et al and the Smejkal et al patent are reiterated with respect to this rejection. Since each of these claims are dependent either directly or indirectly on independent claim 1 or independent claim 33, it is submitted that the previously noted teaching deficiencies of the cited patents are equally applicable to this rejection. Accordingly, withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of the claims over the cited patents are respectfully requested.

Claims 45-46, 49, 51 and 53 were rejected under 35 USC § 103(a) as being unpatentable over the patent to Smejkal et al in view of the patent to Szawarc et al or the patent to Person. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

In view of the cancellation of claims 45-46, 49, 51 and 53 herein, it is submitted that this rejection is now moot. Accordingly, withdrawal of the rejection is requested.

Claim 1 was rejected under 35 USC § 103(a) as being unpatentable over the patent to Smejkal et al in view of the patent to Gerber. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

The above remarks relative to the teaching deficiencies of the Smejkal et al patent are reiterated with respect to this rejection. In particular, it was submitted that the Smejkal patent does not teach, among other things, (a) insulation on the entire upper surface of resistor body and (b) a fused solder layer only on the electrode. It is submitted that the Gerber et al patent does not supply both of these teaching deficiencies.

The Gerber et al patent discloses a surface mount resistor comprised of an elongated strip of resistive material and conductive terminals formed at both ends of the resistive material. However, these conductive terminals 22 and 24 are formed by applying a conductive material over the metallic pads 14 and 16, namely by electroplating as is set forth in column 3 lines 27-32.

Further, high conductivity metallic pads 14, 16 are joined to the resistive material 20 at the ends thereof as is shown in Fig. 2, and described in column 3 lines 27-32. The

metallic pads 14 and 16 are not superposed on the resistive material 20, but are joined to the end surfaces of the resistive material 20. Thus, Gerber et al. fails to disclose that metal strips are affixed on a surface of the resistor body. Accordingly, withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claim 1 over the cited patents are respectfully requested.

Claims 21, 23, 24, 27, 36-37, 39, 40, 43, 46, 48-49 and 52 were rejected under 35 USC § 103(a) as being unpatentable over the patents to Smejkal et al or Person in view of the patent to Shindy et al. In addition, claims 21, 23, 24, 27, 36-37, 39, 40, 43, 46, 48-49 and 52 were rejected under 35 USC § 103(a) as being unpatentable over the patents to Smejkal et al or Person in view of the patent to Takeuchi et al. Reconsideration of these rejections in view of the above claim amendments and the following comments is respectfully requested.

The above remarks relative to the teaching deficiencies of the Smejkal et al and Person et al patents are reiterated with respect to this rejection. Since each of these claims are dependent either directly or indirectly on independent claim 1 or independent claim 33, it is submitted that the previously noted teaching deficiencies of the cited patents are equally applicable to this rejection. It is further submitted that the Shindy et al and Takeuchi et al patents, when taken in combination therewith, do not supply these teaching deficiencies. Accordingly, withdrawal of the rejection under 35 U.S.C. § 103(a) and

Serial Number: 09/825,446

OA dated 6/13/03

Amdt dated 9/15/03

allowance of the claims over the cited patents are respectfully requested.

In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

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